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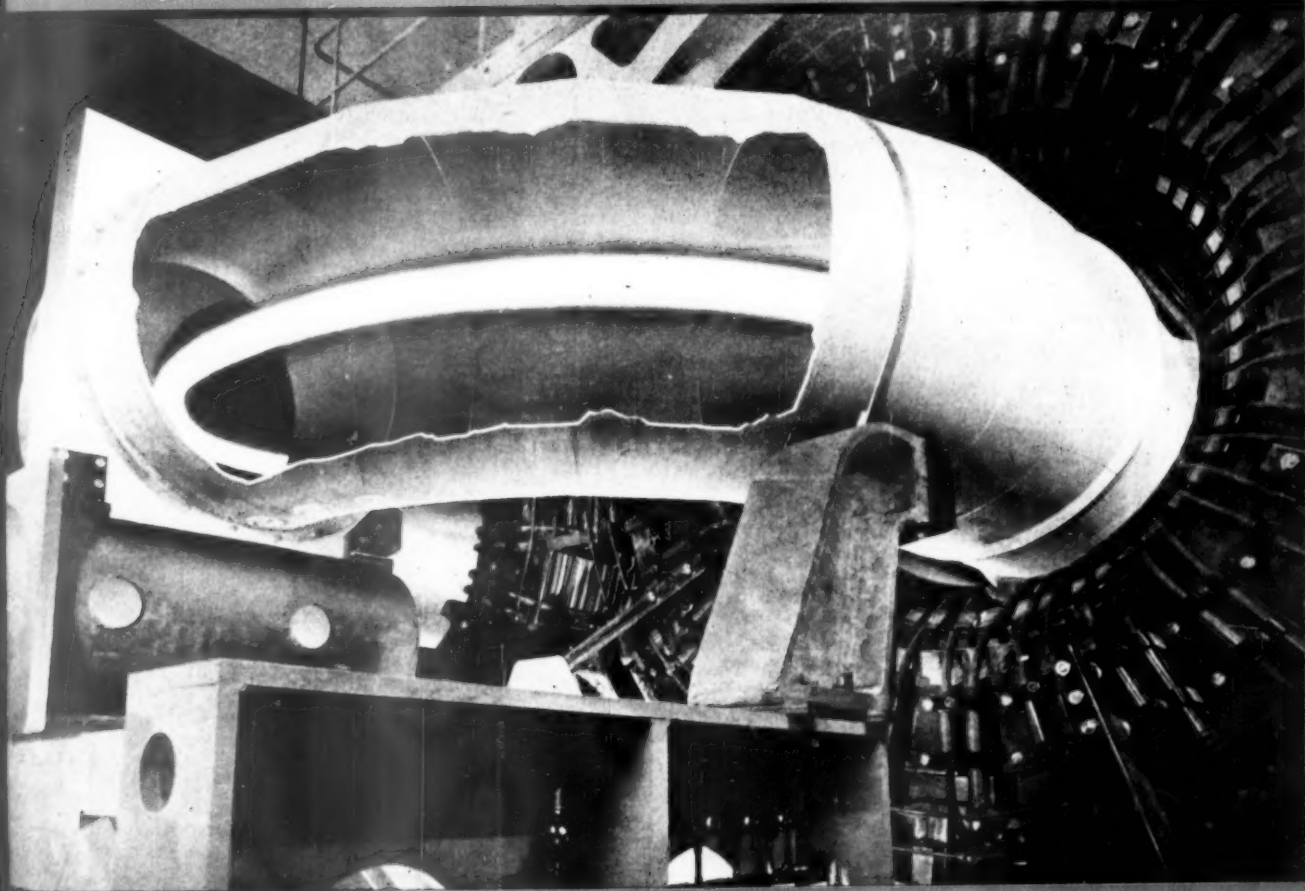
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February 1, 1958

VOL. 73 NO. 5 PAGES 65-80

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



From A to ZETA

See Page 67

A SCIENCE SERVICE PUBLICATION

**Just Imported:**

# World's Smallest Adding Machine

**Fits in Your Pocket! Saves You Time, Money and Mistakes! Perfect for Salesmen, Students, Housewives, Business Men, Storekeepers, Etc. Adds and Subtracts Up to 1,000,000 in Seconds!**

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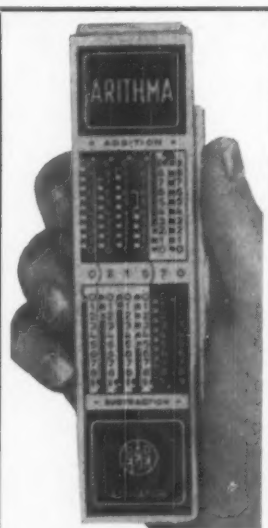
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## PHYSICS

# Control H-Bomb Reaction

British and American scientists report success in the first steps preliminary to producing what will one day result in peaceful power from thermonuclear reactions.

## See Front Cover

► FIERY HYDROGEN bomb reactions have been controlled momentarily at temperatures up to 6,000,000 degrees centigrade in laboratories in the U. S. and England, the atomic energy agency of each country has reported.

This does not mean peaceful power from taming thermonuclear reactions is going to be available soon. It does mean scientists in both countries, and presumably Russia as well, are on the right track in their efforts to harness H-bomb forces, but several years of research are needed before the many remaining problems will be solved. (See page 70.)

Key to the progress announced is the production of thermonuclear neutrons, fundamental nuclear particles also produced when uranium and other atoms fission, or split.

Obtaining these neutrons in a plasma of deuterium gas, even though only for thousandths or millionths of a second, brings mankind a step closer to having limitless power, using the world's oceans as a deuterium source.

The achievement is reported in several scientific papers by both U. S. and British scientists in *Nature* (Jan. 25).

The few millionths of a second during which the thermonuclear neutrons are generated by U. S. scientists is an "appreciable length of time" in this field. Dr. Arthur E. Ruark, chief of the Atomic Energy Commission's controlled thermonuclear branch, has said in explaining the U. S. research.

He cautioned, however, that the research was not yet at a point comparable to the start-up of the first fission reactor in December, 1942.

Much longer containment and temperatures on the order of a hundred million degrees would be required for a power-producing thermonuclear reactor.

In both the British and U. S. experiments, large numbers of neutrons have been produced. The difficult and delicate test is to make sure these neutrons result from thermonuclear reactions. They could be "false" neutrons resulting from collisions with the container's walls or from other unwanted effects.

Dr. Ruark said results to date "encourage" the belief that the undesirable "false" neutrons are not generated in such large quantities as to spoil the desired reactions. Definite proof the neutrons result from thermonuclear reactions is being sought in both countries.

With more powerful and somewhat larger apparatus, he predicted, the present hopeful results "will be exceeded."

The British research was conducted by

the United Kingdom's Atomic Energy Authority at its Harwell facility. Their most promising results were obtained with ZETA, for Zero-Energy Thermonuclear Assembly, which started operation last August.

The photograph on the cover of this week's *SCIENCE NEWS LETTER* is a diagram of ZETA with a cut-away view of the torus and, on the right, the transformer. The white strip in the center of the torus is the hot plasma or hot gas being pinched by the current of electricity.

With ZETA, temperatures of two to five million degrees centigrade were generated and the hot gas was isolated from the container's walls for periods of two- to five-thousandths of a second. The heating process was repeated every ten seconds.

For useful power output, the hot deuterium gas must be kept from touching the walls for much longer times, probably several seconds.

The number of neutrons produced by each pulse of energy in the ZETA apparatus was roughly double that expected from a thermonuclear reaction at the measured temperatures. Some yet unknown process must be the reason, Dr. Lyman Spitzer Jr., director of Princeton University Observatory, concluded after a careful analysis.

U. S. scientists are now working on developing a machine similar to ZETA, but somewhat larger, called the "Model-C Stellerator." Until recently the time schedule for the machine's installation at Princeton University indicated it would be mid-1960 before the stellerator would go into operation. Now, the \$23,000,000 machine is expected to be operating in early 1960.

Scientists associated with the development of the stellerator have "great expectations of it," hoping to achieve temperatures as high as 50,000,000 degrees centigrade with it.

Work on pinched discharges in heavy hydrogen, or deuterium, is now going on in a number of countries. These efforts are inspired by the hope that the gas can be made hot enough, and be confined long enough by its own magnetic field to yield thermonuclear power.

When the gas is fairly dense and very hot, the nuclei, the deuterons, will collide violently and repeatedly. Scientists emphasize the key is "repeatedly." For the last 25 years, scientists have fused deuterons in suitable accelerators.

The joint fusion announcement resulted from a desire on the part of AEC Chairman Lewis L. Strauss and Sir Edwin Plowden, chairman of the United Kingdom Atomic Energy Authority, to correct what they labeled "misinterpretations" about the status of progress in both countries.



**ISOLATING REACTION** — An organic chemist at Lederle Laboratories Division, American Cyanamid Company, completes a reaction in the isolation of Aristocort triamcinolone.

## PHARMACOLOGY

### New Arthritis Drug Announced

► A NEW STEROID drug for treating arthritis, called Aristocort triamcinolone, has been announced by the Lederle Laboratories Division of American Cyanamid Company, Pearl River, N. Y.

Steroids are substances secreted by the adrenal glands and are useful in reducing the painful swelling and inflammation of joints found in arthritis and allied diseases.

The drug is chemically related to four other well-known arthritis drugs, cortisone, hydrocortisone, prednisone and prednisolone, and is reported to create fewer side effects than the older drugs.

Human trials in over 800 arthritic patients have shown the new steroid does not cause sodium and water retention and the loss of potassium.

These side effects had been a problem with cortisone and to a lesser degree with the other steroids.

Persons who could not receive ordinary steroid therapy because of water retention, high blood pressure or overweight have responded to Aristocort treatment without these side reactions, the company said.

Cortisone was first synthesized in 1948 and is one of the 28 steroids secreted by the adrenal glands. It proved extremely valuable for reducing arthritic swelling and pain but in some people caused peptic ulcers, bone softening and other effects. The newer steroids were then synthesized and each has had the desirable anti-inflammatory effects but with milder side reactions.

Aristocort is not a cure for arthritis or asthma, the company said, but it does promise to make steroid therapy available to many more patients.



## GENERAL SCIENCE

# Name Top Young Scientists

The 40 winners of the 17th Annual Science Talent Search have been selected from among the thousands entering this annual competition to find the research scientists of tomorrow.

► THE 40 MOST PROMISING research scientists in America's high schools have been selected in the 17th Annual Science Talent Search. The winners, eight girls and 32 boys, have been invited to Washington for a five-day, all-expenses-paid visit Feb. 27 through March 3.

They will participate in the Science Talent Institute and compete for \$34,250 in Westinghouse Science Scholarships and Awards in the finals of the Science Talent Search conducted by SCIENCE SERVICE.

The 40 trip winners, 15 to 18 years of age, were chosen by a panel of judges after a nation-wide competition in which top-ranking seniors in all the public, parochial and private schools in the continental United States were invited to participate. Contestants, representing 47 states and the District of Columbia, completed the difficult science aptitude examination, submitted recommendations and scholarship records, and wrote a report on "My Scientific Project."

During the past 17 years 249,955 high school seniors have entered the Search. Of this number only 48,098 have been able to complete all the requirements. This year, of the 25,039 examinations sent to 3,298 high school educators, only 4,050 students cleared all the hurdles to qualify for the Search.

Of these, 1,074 scored high enough on the aptitude test to be named Candidates. The 40 winners and 260 honorable mentions, the latter to be announced shortly, were then chosen from the Candidate group.

On March 3 at the end of the Science Talent Institute the judges will make the awards. Five winners will be selected to receive one of the following: \$7,500, \$6,000, \$5,000, \$4,000, \$3,000 in four-year Westinghouse Science Scholarships. A total of \$8,750 in Westinghouse Science Awards will be given at the discretion of the judges to the other 35 winners.

## National Representation

Chosen without regard to geographic distribution, the 40 trip winners come from 35 cities in 19 states and the District of Columbia. States represented by winners since the beginning of the Search in 1942 now total 43.

All but one of the winners live at home and attend their local or nearby public, parochial or private secondary schools.

A check shows that 32 of the students are in the top five percent of their graduating classes and 20 of them rank first, second or third. Classes range in size from 29 to 1,243 seniors. Exactly 70% of the winners' fathers and 50% of their mothers attended college. Of the winners, 23 claim no scien-

tists among their relatives; the others have one or more scientists in their families.

Contrary to a frequent notion about scientists, these talented young people do not confine their interest and enthusiasm to science. While most of them spend much of their spare time in activities such as science clubs and individual science hobbies they also enjoy such varied interests as photography, music, sports, reading and creative writing. Most of them belong to extra-curricular, social and educational organizations and more than half of them have held office in these clubs. Five of them have been finalists in the National Science Fair.

Each of the 40 already has chosen the line of study he wishes to pursue. Fourteen plan to become physicists. Six hope to be engineers; five are headed for careers in biochemistry and five in mathematics. Chemistry is the final choice for three and two hope to be physicians. One each is planning to be an astronomer, biologist, psychiatrist, zoologist. One refuses to commit himself further than to say he will be a scientist. All expect to do research in their respective fields.

Only two high schools in the U. S. have produced more than one winner this year. Jamaica (N.Y.) High School and Newton High School of Newtonville, Mass., will each send two boys to the Science Talent Institute.

## Schools Win New Laurels

Among the 40 a total of 25 come from schools that have never before placed a winner in the Science Talent Search. The other 15 are adding new laurels to schools already honored in the past by having produced winners.

Each school having a winner receives a bronze and walnut plaque to add to the school's trophy collection.

With a 17-year total of 19 winners, Bronx High School of Science in New York City leads previously honored schools who have additional winners this year. Only one school, with a total of 21, has had a larger roster of winners.

In the 17 years of the Search Erasmus Hall High School, Brooklyn, N. Y., has produced 11 winners. Newton High School, Newtonville, Mass., and Kenmore (N.Y.) Senior High School are each credited with five winners. The following have had four winners each: University High School, Bloomington, Ind.; Phillips Academy, Andover, Mass.; and Columbus High School, Marshfield, Wis. Three winners have been produced over the years by Lyons Township High School, La Grange, Ill., and Central High School, Omaha, Nebr.

The following schools now have a record of two winners for the 17 years of the Search: El Cerrito (Calif.) High School, Tamalpais High School, Mill Valley, Calif.; Anacostia High School, Washington, D. C.; Ithaca (N.Y.) High School, and Overbrook High School, Philadelphia, Pa.

## "Honorable Mention" List

In addition to the 40 trip winners, who will attend the Science Talent Institute in Washington, an Honorable Mentions list of 260 in this year's Search will be announced. These high ranking contestants will be recommended to colleges and universities for their aptitude in science. All 300 will receive offers of scholarships from many in-

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stitutions of higher education seeking students with talent in science.

Through an arrangement with Science Clubs of America, 31 states and the District of Columbia are conducting state Science Talent Searches concurrently with the national competition. Thirteen of them have produced winners this year. In these 32 areas all entries in the National Science Talent Search will be turned over to state judging committees. From their entries they will choose state winners and award scholarships to various colleges and universities within the state. Cooperating states are: Alabama, Arkansas, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New Mexico, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia and Wisconsin.

### Search Sponsors

The Westinghouse Educational Foundation, supported by the Westinghouse Electric Corporation, provides the scholarships and awards and makes the Science Talent Search financially possible as a contribution to the advancement of science in America.

The annual Science Talent Search is conducted by Science Clubs of America, administered by SCIENCE SERVICE. Science Clubs of America is the international organization for science groups in schools and out. Today more than 17,000 clubs are affiliated here and abroad, with a membership of almost a half million young people.

### Science Fair in May

The other annual event, conducted by Science Clubs of America, is the National Science Fair which will be held in Flint, Mich., May 7 through 10, 1958. Twenty-three of the Science Talent Search Candidates this year have been finalists in recent National Science Fairs.

SCIENCE SERVICE is the non-profit institution for the popularization of science, with the trustees nominated by the National Academy of Sciences, National Research Council and the American Association for the Advancement of Science, the E. W. Scripps Estate and the journalistic profession.

Judges of the Science Talent Search, who selected the winners, are Dr. Harold A. Edgerton, vice president of Richardson, Bellows, Henry & Co., New York; Dr. Stuart Henderson Britt of Northwestern University, Evanston, Ill.; and Dr. Rex E. Buxton, psychiatrist of Washington, D. C. Drs. Edgerton and Britt design the Science Aptitude Examination each year for the Science Talent Search.

Students and teachers not familiar already with the year 'round program of Science Clubs of America and the two annual events for young scientists—the Science Talent Search and the National Science Fair—are invited to write to SCA, 1719 N St., N.W., Washington 6, D. C.

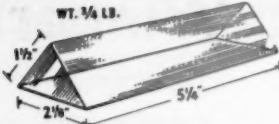
Science News Letter, February 1, 1958

### GENERAL SCIENCE

# Washington Trip Winners

HOME ADDRESS follows name of school

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Shepard, Kenneth Wayne	17 Sidney Lanier H.S. 3854 Maclamar Rd.
<b>ARIZONA</b>	
Jensen, Richard Joseph	16 Salpointe H.S. 5602 East Silver St.
<b>CALIFORNIA</b>	
Kirk, Rodney Carlos	17 Albany H.S. 904 Evelyn St. 6
Williams, Robley Cook, Jr.	17 El Cerrito H.S. 1 Arlington Ct., Berkeley 7
Kukla, Andy	16 Fairfax H.S. 8409 Blackburn Ave. 48
Nininger, Neil Logan	18 Tamalpais H.S. 24 Liberty St., Larkspur
<b>DISTRICT OF COLUMBIA</b>	
Rice, Jerry Mercer	17 Anacostia H.S. 161 Chesapeake St., S.W. 24
Devine, Paul Joseph, Jr.	17 Gonzaga H.S. 6157 12th St., N., Arlington 5, Va.
<b>FLORIDA</b>	
Pestcoe, Allan Emanuel	17 Miami Beach Senior H.S. 6375 Indian Creek Dr. 41
<b>ILLINOIS</b>	
Londak, Bernadette Genevieve	17 Mercy H.S. 7749 South Langley Ave. 19
Dyroff, David Ray	17 Dupu Community H.S. Box 275
Jerina, Donald Michael	18 Leyden Community H.S. 2427 N. Clinton St., River Grove
Gentle, Kenneth William	17 Lyons Township H.S. 843 Homestead Rd.
<b>INDIANA</b>	
Martz, Eric	17 University H.S. 817 Atwater Ave.
<b>IOWA</b>	
Martens, Charles Paul	17 Charles City H.S. Route 4
<b>MARYLAND</b>	
Gaidis, James Michael	17 Baltimore City College 1511 Carswell St. 18
<b>MASSACHUSETTS</b>	
Weihofen, William Henry	17 Phillips Academy 908 Avenida Cielito, N.E., Albuquerque, N. Mex.
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Beeuwkes, Reinier III	17 Newton H.S. 123 Sargent St., Newton 58
Mitrovich, Dushan	18 Newton H.S. 105 Waban Hill Rd., Chestnut Hill 67
<b>MICHIGAN</b>	
Burns, Stephen Kent	17 Romeo H.S. 147 Church St.
<b>MONTANA</b>	
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<b>NEBRASKA</b>	
Kripke, Saul Aaron	17 Central H.S. 119 N. Happy Hollow Blvd. 32
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Shelby, Jane	17 Teaneck H.S. 431 Claremont Ave.
<b>NEW YORK</b>	
Kapuler, Alan Mitchell	15 Erasmus Hall H.S. 47 E. 16 St. 26
Halperin, Bertrand Israel	16 George W. Wingate H.S. 7 Balfour Pl. 25
Cantrell, Cyrus Duncan III	17 Ithaca H.S. 228 S. Geneva St.
Burger, Richard Melton	16 Jamaica H.S. 21-15 34 Ave., Long Island City 6
Wagreich, Philip Donald	16 Jamaica H.S. 67-47 182 St., Flushing 65
Okun, Lawrence Merritt	17 Kenmore Senior H.S. 259 Hartford Ave. 23
Kuzmack, Arnold Mark	16 Bronx H.S. of Science 37-22 95 St., Jackson Heights 72
Herschkopf, Sybil	17 Ramaz H.S. 638 W. 160 St. 32
Rosner, Jonathan Lincoln	16 Roosevelt H.S. 300 Hollywood Ave., Tuckahoe 7
<b>OHIO</b>	
Smith, Leslie Ewart	17 Vermilion H.S. 39 Huron Rd.
<b>OREGON</b>	
Marshall, Ruth Ann	17 Corvallis Senior H.S. 302 N. 21st St.
<b>PENNSYLVANIA</b>	
Erlich, Elvera Rena	15 Overbrook H.S. 5648 Diamond St. 31
Waldman, Lise Jo	16 Upper Darby Senior H.S. 625 South Ave., Secane
<b>WISCONSIN</b>	
Karau, Jane Ruth	17 Columbus H.S. 510 W. 6th St.
<b>WYOMING</b>	
Wallace, Lynda Diane	17 Saint Mary H.S. 3421 Dover Rd.

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**PHYSICS****Hydrogen Power Studies Aid Space Propulsion**

► **WHEN MAN** starts navigating to the moon and other planets in space ships, studies of how to tame the fearsome power of hydrogen bomb reactions for peaceful purposes may result in a feasible method of ion propulsion. (See p. 67.)

This possibility was foreseen by Dr. James L. Tuck, Los Alamos Scientific Laboratory physicist who did some of the pioneering work aimed at controlling thermonuclear reactions. Ionic propulsion would not help in lifting a space ship off the earth's surface, he said, but it could be a good way of obtaining high thrust without carrying a lot of fuel.

Dr. Tuck said the tricks learned in making a "magnetic bottle" for confining the hot gases in a peaceful hydrogen power station could probably also be applied in space propulsion. The ship could shoot rearward gases at much higher temperature with such new techniques than any material now known could withstand.

Essential to controlled hydrogen power is an understanding of magnetohydrodynamics, the study of the interaction of magnetic fields and fluids or gases. A by-product of these studies, Dr. Tuck predicted, could be a means of traveling in space without using up a great deal of mass.

He said that even if a thermonuclear reactor could not be built to produce power economically, it might prove worthwhile for space navigation.

Science News Letter, February 1, 1958

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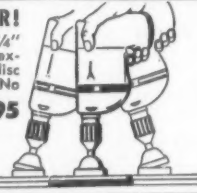
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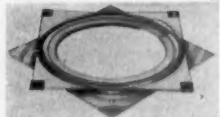
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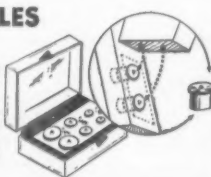
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**MEDICINE****Experts to Study "Laughing Death"**

► **PRIMITIVE** people are literally laughing themselves to death in New Guinea.

Adelaide University, Sydney, Australia, is sending a medical team to New Guinea to conduct research into the "Laughing Death" disease.

The disease, known locally as KURU, is killing members of the Fore people in the eastern highlands of New Guinea.

Dr. Hugh N. Robson, professor of medicine, visited New Guinea in November when the first occurrence of the strange disease was reported. He will conduct further study of the disease early this year.

The research has so far revealed that about one native in 100 contracts the disease, and about 100 new cases occur each year, attacking mainly children and young women.

The first report of the disease in New Guinea said that natives "laughed their heads off" until they died.

Science News Letter, February 1, 1958

Instruments used to check the electronic and mechanical systems in aircraft and missiles can measure the width of a hair at a distance equal to the length of a football field.



## METEOROLOGY

# "Moon" Not Forecast Aid

► OBSERVATIONS of cloud cover and other weather events seen from earth-circling satellites will probably not revolutionize weather forecasting in the near future, as some scientists have foreseen.

Two warnings that expecting immediate improvement in weather prediction accuracy as a result of satellite observations is overly optimistic are sounded in two meteorological journals.

The three scientists reporting their views agree the greatest improvement in forecasting is likely to result not directly from seeing the weather over the whole earth but from gaining an understanding of the global relations of weather systems.

As an example, Dr. Arnold H. Glaser of Allied Research Associates, Inc., Boston, points out that a storm affecting New York's weather two days from now could be brewing today in the Gulf of Mexico. This storm's strength and destination may be controlled by events in the Caribbean, and these events in turn may be influenced by earlier occurrences in the Southern Hemisphere.

Thus, Dr. Glaser concludes, "any attempt to trace back a meteorological chain of events leads rather promptly to events occurring over parts of the globe where regular observations are not easily available."

## PHYSICS

# Reds Try Taming H-Power

► RUSSIA is making substantial progress towards harnessing the H-bomb or controlling thermonuclear reactions.

This is well-known to Western scientists, particularly those involved in the Anglo-American fusion experiments. (See p. 67.)

Alexander Topchiev, secretary of the Soviet Academy of Sciences, has said recent Russian experiments in controlling thermonuclear reactions had moved the Soviet effort nearer to the building of "a reactor capable of working on heavy and super-heavy hydrogen (deuterium and tritium), and not on uranium fuel."

Although little is actually known of what the Russians are doing to harness the H-bomb, what is known has convinced Western scientists that Soviet scientists are doing original and highly expert work.

Three leading Russian nuclear scientists directly at work on fusion are Igor Kurchatov, Mikhail Leontovich and Lev Artimovich.

It was Kurchatov who, in April 1956, startled and shook both British and American scientists by openly and frankly discussing fusion at Harwell in England. At this time, research on fusion in both Western countries was wrapped in tight security blankets.

Kurchatov, who is Russia's top atomic energy man, deliberately lectured on So-

Weather forecasts for regions where the surrounding weather is known and can be studied and analyzed, such as the central Midwest, are considerably more accurate than predictions for the eastern seaboard. Sudden weather changes along the East Coast are often not forecast simply because meteorologists do not have sufficient observations from over the Atlantic Ocean.

Drs. William K. Widger Jr. and C. N. Touart of the Air Force Cambridge Research Center, Cambridge, Mass., after a thorough analysis of using satellite observations in weather analysis and forecasting, conclude that present-day prediction methods and the data to be expected from a satellite are not compatible.

They urge a research program, to be started immediately, aimed at tailoring the satellite data so they can be used by today's forecasters. As a start, they suggest that several high-altitude airplanes of photo-reconnaissance types be flown for several years to gather observations and photographs of cloud masses as seen from above.

Dr. Glaser's report appears in *Weatherwise* (Dec., 1957), and that of Drs. Widger and Touart in the *Bulletin of the American Meteorological Society* (Nov., 1957). Both are current publications of the American Meteorological Society.

Science News Letter, February 1, 1958

viet experiments on fusion reactions, revealing for the first time the methods used.

It is also known that the Russians are working with high energy impulse discharges much the same as Western scientists, and have obtained temperatures in excess of 1,000,000 degrees centigrade. If they had obtained this in 1956, as Kurchatov disclosed they already had, it is believed that by now they must have reached temperatures of 5,000,000 degrees centigrade or higher.

Science News Letter, February 1, 1958

## GENETICS

# Skin Grafts Help Predict Offspring Before Mating

► SKIN GRAFT reactions between two animals may be useful in predicting characteristics of their offspring before mating takes place, John E. Berry, Kansas State College, Manhattan, has found.

The extent of the graft reactions is governed by antigens in the skin. These are protein compounds which are controlled by genes, and these, in turn, are factors concerned with the transmission and development of hereditary characteristics.

Animals that are close relatives have more antigens in common and therefore show less reaction. Those not closely related, hav-

ing few antigens in common, show a greater reaction, the researcher believes.

The intensity of the reaction, then, gives an estimate of the genetic similarity between the two individual animals being tested. If the grafting technique proves successful, it can be used by animal breeders to guide them in more accurate selection of the animals they will breed.

The intensity of the graft reaction is measured by comparing the changes in the white blood cell counts in blood samples collected before and after the grafting is done.

If the animals are closely related, there will be little change in the cell counts. If not closely related, a greater number of certain white cells will be present.

Science News Letter, February 1, 1958

## NUTRITION

# Improvement in Diet Helps Mental Patients

► THE RESPONSE of mental patients to an abundance of well-liked foods is striking, Dr. Hayden H. Donahue and Phoebe A. Fowler of the State of Oklahoma Department of Mental Health, Norman, reported to a symposium on nutrition and behavior.

Since inaugurating an adequate dietary standard at the State Mental Hospital, they found, fights in the dining room are extremely rare whereas formerly they occurred during almost every meal. Night cries and screaming have also diminished. Dry skin, red, swollen joints, dull and lifeless hair are not as great problems as formerly.

The emotional significance of food is deeply rooted, they explain. Eating represents the child's first contact with the reality of the external world. Similarly, eating can and should become one of the important forces in the treatment and resocialization of mental patients.

Food consumption in the hospital was improved by the elimination of greatly disliked and monotonous foods. Dried black figs were one of these foods. They are no longer being purchased. Oatmeal had been served every morning with syrup for years, as far back as menus can be located.

These foods were eliminated in spite of the fact they are nutritious because they cannot "contribute nutrients to a diet when they end in the garbage can."

The form in which foods are served can be very important to the mental patient. One old man was so impressed when he was given a whole banana that he was moved to tears as he remarked that he did not know that bananas still grew.

"Every meal," the scientists say, "should be recognized as an opportunity for the socialization of the patient. Every personal contact with the patient should represent a positive step in his rehabilitation."

Science News Letter, February 1, 1958

Titanium engine parts can be welded in a plastic bubble that holds argon gas.

Malaria infects some 250,000,000 persons each year.

## ACOUSTICS

## Gunfire Deafens Ears Of Jet Plane Mechanics

► GUNFIRE was considered to be the major cause of hearing loss among 1,200 jet plane mechanics and other aircraft maintenance men studied at Naval Air Station Cecil Field, Jacksonville, Fla.

Hearing tests were first made in hot weather during heavy flight operations and then a follow-up test was made in cold weather with little flying.

The men exposed to noise from both piston type engines and jet engines without afterburners showed more hearing loss than non-exposed men of the same age. But the difference became insignificant when it was taken into account that the maintenance men had also been exposed to more gunfire.

Aircraft noise produced temporary hearing losses that were flatter in frequency change than the shifts caused by gunfire and other impact noises.

The survey also turned up the interesting and as yet unexplained fact that the right ear was more sensitive to sound than the left ear. Tests showed that this was not because the left ear had been subjected to more noise than the right one. The difference seemed to be somehow related with the handedness of the individual, although no final conclusions about it could be drawn.

It was found that hearing generally improved between the two tests when protective helmets were worn by the personnel. In contrast to their attitude about ear plugs, which was almost always unfavorable, the men generally liked the helmets and wore them more frequently.

The study was made by Dr. W. Dixon Ward, Central Institute for the Deaf, St. Louis, Mo., and U. S. Naval School of Aviation Medicine, Pensacola, Fla. It is reported in *The Journal of the Acoustical Society of America* (Dec. 1957).

Dr. Ward is now with the Subcommittee on Noise in Industry, Los Angeles.

Science News Letter, February 1, 1958

## PHYSIOLOGY

## Built-in Alarm Clock Governs Worm Behavior

► STUDIES of a worm may throw light on the internal rhythms of other animals, such as man's heartbeat, Dr. G. P. Wells, zoologist of the University of London, reported to the Smithsonian Institution, Washington.

The worm studied by Dr. Wells is the European lugworm. It is about the size of a fountain pen and makes its home on beaches of muddy sand. Its brain is very small and its nervous system is comparatively simple.

The lugworm lives a sheltered and simple life under the sand, alternately eating sand and digesting some of the organic content, then backing to the surface and ejecting the residue.

It feeds in little bursts, each lasting for a few minutes, with rests of a minute or so in between. It makes its backward trips to the

surface also at regular intervals, usually once every 40 minutes.

The alternate feeding and ejection, Dr. Wells found, despite their rhythm are not controlled by the biological need of the worm for food or for relief from its fullness. Put into a glass tube of sea water without any sand to eat, the worm continues with the little bursts of feeding movements and goes on making its backward trips, even though it is not burdened with sand to eject.

Its action seems to be controlled, Dr. Wells concludes, by a "physiological alarm clock." He has located the "alarm clock" in the esophagus of the worm. When the esophagus is removed and put in a dish of sea water, its complicated, automatic rhythm can be seen.

When the worm is intact, the activity of the esophagus can spread through the body and cause periodic feeding movements of the whole worm.

Dr. Wells found a similar inherent rhythm in the singing of some wild birds. The chaffinch is one such bird; it shoots off little song phrases at extremely regular intervals, often of about ten seconds. Even chaffinches that have been reared in isolation will sing at about the usual intervals.

Science News Letter, February 1, 1958

## MEDICINE

## New Drug Promises Protection Against TB

► A DRUG that promises to protect man from developing tuberculosis instead of helping to cure the disease after it appears has been synthesized at the Irish Medical Research Council, Trinity College, Dublin, Ireland.

The drug, still known by the laboratory label B663, has been shown in experiments with animals to be more effective against the tubercle bacillus than any other anti-tuberculosis agent in present-day use, Dr. Vincent Barry, director of the Council, reported.

Current compounds control TB only when they are administered after the moment of infection. A remarkable thing about the new drug is that even when given to the experimental animal some time before inoculation with the germ takes place, it still exerts its full curative power.

A group of mice was given small amounts of the drug for some weeks and then injected with a lethal dose of virulent tubercle bacteria. A second group of mice which had not received any drugs were inoculated in the same way.

On the average, the untreated animals died in two weeks. All the treated mice were still alive four months later.

If this principle is applied to man, the new drug holds out the possibility of being able to protect persons susceptible to TB against exposure to the natural infection.

Compound B663 is a member of the phenazine family of dark red dyes, some of which are used in bacteriology to stain germs for examination under the microscope. It is completely non-toxic for the animals investigated.

Science News Letter, February 1, 1958

# IN SCIENCE

## SURGERY

## Surgical Thread Gets Atomic Sterilization

► THE CATGUT used for surgical stitches is now being sterilized by atomic energy at Ethicon, Inc., Somerville, N. J., a division of Johnson and Johnson.

The atomic sterilization process which has been in the experimental stage for 10 years, has become a full-time commercial process.

The sutures are sterilized after they have been put in their sealed containers by bombarding them with high speed electrons.

Three major advantages for the process are the elimination of the danger of recontamination after sterilization; greater tensile strength in the suture than is found in heat-sterilized catgut; and 10 times the safety margin for the surgeon, Dr. Walton Van Winkle Jr., director of Ethicon research, said.

The electron beam process can be likened to surfboard riding. The electrons are generated by high voltage apparatus and are sent along a radar wave in a tube until they reach the traveling belt carrying trays of sutures.

The sterilization is accomplished as the electrons destroy all microorganisms in or on the catgut suture by altering the molecular structure of the bacteria without disturbing the structure of the suture itself.

Electrons are used because they do not produce any residual radiation, and no radioactive byproducts are formed in the process. The sterilization is done in a room lined with seven and a half feet of concrete.

Science News Letter, February 1, 1958

## FOOD TECHNOLOGY

## Antibiotics Preserve Fish Up to Two Weeks

► FRESH FISH caught in the oceans may soon be plentiful in Midwestern markets as a result of the use of antibiotics for preservation up to two weeks without freezing.

The fish are given a dip in the antibiotic, Aureomycin, and then refrigerated. Commercial scale experiments have demonstrated that the fish remain fresh and marketable for as long as two weeks.

The experiments were performed by Dr. Lionel Farber and Peter Lerke at the University of California Medical Center, San Francisco.

Use of antibiotics to preserve fish for market must be approved by the Food and Drug Administration. FDA previously has found such a method acceptable for poultry preservation.

The antibiotic prolonged the freshness of fish whatever the conditions, but was best when sanitation and refrigeration were good and when treatment came early after the catch.

Science News Letter, February 1, 1958



# CE FIELDS

## MEDICINE

### X-Rays of Kidneys Can Raise Blood Pressure

► X-RADIATION of the kidneys can cause high blood pressure in humans, Drs. Clifford Wilson and J. M. Ledingham, The University of London, and M. Cohen, The London Hospital, London, England, have found.

They described two cases where heavy doses of X-rays were used to treat cancer patients. One of the patients was apparently cured by the X-rays but was re-hospitalized eight years later with a fatal case of high blood pressure and uremia. The other patient died 11 months after X-ray treatment.

From these two cases and a series of animal experiments, the researchers concluded that irradiation of the kidneys has two distinct and independent biological effects.

One is interstitial fibrosis, in which delicate kidney tissue is damaged and begins to scar, and the other is hypertension or high blood pressure.

"Both in man and in the rat these effects may develop together or separately," the scientists report in the British medical journal, *The Lancet* (Jan. 4).

The most important finding was that high blood pressure could be produced by irradiation of the kidney in the absence of kidney tissue changes. Later, the structural changes do occur, but they closely resemble the lesions found normally in many cases of high blood pressure, and so must be regarded as secondary to the hypertension.

An interval of several months after the irradiation and before the high blood pressure appears is a regular and striking phenomenon both in man and in the rat. The reason for the delay is not known, but it may be related to the regeneration time of vascular tissue and the selective effect of irradiation on immature cells, the scientists conclude.

Science News Letter, February 1, 1958

## ANTHROPOLOGY

### American Boys Get More Height Earlier Than Dads

► NOT ONLY are Harvard students of the present generation taller than their fathers, they are less fat and more muscular.

This is reported in *American Anthropologist* (Feb.) by Dr. Edward E. Hunt Jr. of Harvard University and Forsyth Dental Infirmary for Children.

The sons have broader necks, shoulders and waists than their fathers and these increases are about equal. But their hips are narrower, giving them a more "masculine" appearance.

When it was first observed young men

of today appear taller than their fathers were at the same age, scientists wondered whether their height was greater when fully grown or whether they merely got their growth at an earlier age.

Now it has been found that in England growth is earlier but there is no increase in final height. In the United States, although acceleration of growth has been striking, there is also an increase in final height.

Comparison of fathers with sons at Harvard and mothers with daughters at several eastern women's colleges shows no difference in the age at which final height is attained.

Evidence was found, Dr. Hunt reports, that the fathers underwent more frequent arrests of skeletal growth than did their sons.

Contrasted with the accelerated growth in the United States and England are the measurements obtained among the Micronesians of Yap. The people there have remained unchanged in height since the late 19th century and are characterized by a late attainment of adult stature.

Science News Letter, February 1, 1958

## SURGERY

### Use Artery of Heart To Repair Esophagus

► CANCER-RAVAGED throats can be repaired by using the large artery of the heart.

This promising new technique of restoring the esophagus was reported at the southern section of the American College of Surgeons meeting in Palm Springs, Calif., by Dr. Joel Pressman, professor of surgery at the University of California at Los Angeles.

The research has been supported by the U. S. Public Health Service.

The technique was developed during years of animal experimentation, the UCLA surgeon said. The operation has been performed successfully in two human cases.

The large artery, known as the aorta, is the main exit of blood from the heart. Supplies for surgical use can be obtained from a human artery bank where the artery is stored dehydrated in a sealed tube.

The aorta may be used as an intact tube to replace the entire section of the esophagus situated in the neck. Or a portion of it may be used to "patch" the cervical esophagus, depending on how much of the organ has been removed in cancer surgery.

Actually the aorta serves as a "form" around which the body's natural repair processes rebuild a new esophagus. The artery may remain in place for many months but is eventually absorbed and replaced by new tissue.

The elastic tissue of the large artery seems ideally suited to the body's repair processes, Dr. Pressman said. This is because it is absorbed much less slowly than other soft tissue. Portions of it can be identified for as long as two and one-half years. Other materials, such as polyethylene tubes, have been tried but have not proved suitable for repairing the esophagus.

Science News Letter, February 1, 1958

## PHYSIOLOGY

### Cats and "Hot" Mice Used to Study Drugs

► ADULT CATS and electrically "hot" mice are being used to study the effects of tranquilizers and similar drugs on conditioned behavior.

The cat-and-mouse test was developed by three Canadian scientists who first conditioned the cats against mice by an electric current applied whenever the mouse was attacked.

The test is done on a concrete floor with an automobile spark/coil and battery supplying the current. The mouse is "wired" by a clip on the tail and when the cat attempts to pick up the mouse, the current is applied by the operator.

Before drug tests, the cat is taught to ignore the presence of a mouse with a few shocks. Some cats give up after only one such experience; the average cat takes three. After that, the avoidance behavior will last for several weeks without further conditioning.

But if certain tranquilizing-type drugs are given to the cats, they continue attacking the mice regardless of the shocks. The cat feels the shock, for the mouse is dropped, but it is picked up again and again.

How quickly the cats forget their learning about the charged mice is an indication of the strength of the tranquilizer.

The test has the advantage of requiring only a short training period and yet giving results that compare well with those from more involved procedures, the scientists report.

The cat-and-mouse test was developed by P. Sacra, W. B. Rice and J. D. McColl, Research Laboratories, Frank W. Horner Ltd., Montreal, Quebec, and is reported in the *Canadian Journal of Biochemistry and Physiology* (Dec. 1957).

Science News Letter, February 1, 1958

## TECHNOLOGY

### Wind Tunnel Will Test Nose Cone for Missiles

► A WIND TUNNEL that will reach the extreme speeds and temperatures needed to test nose cones for the Navy's Polaris missile is being built at Palo Alto, Calif.

In it speeds of 15,000 miles an hour and temperatures of 18,000 degrees Fahrenheit, more than 6,000 degrees hotter than the sun's surface, are reached momentarily. The tunnel, being built by Lockheed's Missile Systems division, uses shock waves to generate the high temperatures.

It is one of three similar wind tunnels, the other two being located at the U. S. Air Force Research and Development Command's engineering center at Tullahoma, Tenn.

A 20,000,000-kilowatt jolt of electricity will send a blast of air against a nose cone with the tremendous force and heat the cone would meet in hypersonic flight through the earth's atmosphere.

Science News Letter, February 1, 1958

## SURGERY

# Drug Makes Surgery Safer

Much of the safety of modern surgery comes from using one of the most deadly drugs known, a muscle relaxant that can paralyze completely in less than a minute.

By JOHN W. ROBINSON

► A DRUG that can kill in 60 seconds is now being routinely injected into the human body to make surgical operations safer than they have ever been in the past.

The drug, and others like it, is known as a muscle relaxant. In non-medical terms, a muscle relaxant is a paralyzer. A surprisingly few drops of it in the blood stream will cause a normal man to collapse in a motionless heap. He will still be able to think and feel, for this drug, though part of modern anesthesia, is not itself anesthetic, but he will be powerless to even lift an eyelid.

A few more drops and his diaphragm, one of the last muscles to go, would slow down and stop and then breathing would be gone.

Probably the best known of these paralyzers is curare, used for hundreds of years by South American head hunters to tip their poisoned arrows. A synthetic drug is now being used, however, that is even more instantly lethal than curare and curare-like drugs. Its name is succinylcholine (SUCK-sin-ill KO-leen).

"For modern surgery," Dr. Joel B. Hoberman, chief of anesthesiology at Suburban Hospital, Bethesda, Md., explained, "succinylcholine does in seconds what it used to take ether anesthetic 10 to 15 minutes to do. It completely relaxes the muscles of the body so that the surgeon can do his job without having to fight them. This complete relaxation is a prime requirement of good surgery."

Before the relaxants came along, and when ether was the main surgical anesthetic, this needed relaxation could be brought about in only one way. That was by putting the patient so far "under" that not only was he asleep, but he was gassed to the point that even his breathing was beginning to fail.

If muscles were too tight when the surgeon was ready, he would tell the anesthesiologist to "pour more on" until he got the degree of relaxation he wanted.

The dangers of ether in the early days were those of time. It may take ten minutes before the "surgical" stage of ether anesthesia is reached, so there was always the chance that the surgeon would go ahead too fast. The body would still be able to fight back and a sudden shock, even as seemingly innocent as painting the skin with alcohol, could bring on sudden heart failure.

## Surgical Giant Step

With the development of quick-acting anesthetic drugs like Pentothal, anesthesi-

ology took a giant stride forward, but still the amount of relaxation depended on how heavily the patient was drugged.

This has all been changed with the development of muscle relaxants like succinylcholine.

Now, the amount of relaxation has little to do with the depth of anesthesia. Only enough anesthesia is given to put the patient in a light sleep, and once this is done, the relaxation is accomplished by succinylcholine.

The relaxant is injected, drop by drop, until the surgeon has been given all the muscle relaxation he needs.

Before being wheeled into the operating room, today's surgery case may receive first a tranquilizing pill and then just enough of a narcotic to dissolve his fear. Once on the operating table, a needle is inserted into his arm which can carry both the anesthetic and a slow drip from a marked bottle hanging over his head.

A red warning sticker on the bottle indicates that succinylcholine has been added to the dextrose solution it contains.

By controlling the number of drops per minute that enter the patient's blood stream, the anesthesiologist gives the surgeon the exact amount of relaxation needed, not too little, not too much.

"For lung surgery, the drip rate has to

be only one drop more per second than is needed for simple appendectomy, but this relatively slight increase in rate completely stops normal breathing," Dr. Hoberman said.

Respiration is then taken over by the anesthesiologist who can control it to an even finer degree than nature can.

The great value of succinylcholine is that it works extremely fast and disappears from the blood with the same speed. After a single injection of it, complete relaxation occurs in about one minute, lasts for another two, and then is followed by rapid recovery within the next few minutes. A continuous drip is used to prolong the action for as long as needed.

What the drug does in the body is not fully understood, just as the action of ether is not yet completely known. It is known, however, that the drug acts on the spots in the body where the nerves attach to the muscles.

## Nerve-Muscle Junctions

These areas are known as myoneural junctions. Here electrical impulses traveling down the nerve pass across and stimulate the muscle. Technically, succinylcholine is known as a depolarizing agent because it causes a change in the electrical polarity of the muscle fibers. As a result of this change, the muscles receive no nervous stimulation and paralysis results.

Luckily, the drug does not paralyze all muscles, for if it affected heart muscle in



**NEW DRUG IN ANESTHESIA**—Surgery has entered a new era in safety, thanks to the careful use of tiny amounts of a paralyzing drug that is even more dangerous than curare, the Indian arrowhead poison.

the same way it would cause instant death. Its effects are limited to most of the striated muscles, those which are attached to the bones.

Succinylcholine has an important advantage over curare and curare-like drugs in that it will easily relax throat muscles.

The larynx remains tense even after a person has been put to sleep with Pentothal. In fact, Pentothal seems almost to sensitize the laryngeal muscles so that any irritation may set off a spasm of the vocal cords. This tendency can be counteracted by giving other drugs before Pentothal, but once in a while a laryngospasm will occur. Succinylcholine can quickly relieve such spasms. It is also useful in relaxing the throat so that a breathing tube may be inserted.

Curare drugs can be used to relax the throat also but they take longer to act and must be used in heavier doses.

Succinylcholine is remarkably free of any bad side effects, perhaps because its extraordinary power has limited its use to only highly trained anesthesiologists.

In their hands, this powerful paralyzer means a much safer operation and a faster, easier recovery from the anesthetic.

Science News Letter, February 1, 1958

#### ENTOMOLOGY

### Humidity Affects Insect Mortality

► MOSQUITOES may be more susceptible to a killing dose of DDT when the weather is dry.

In contrast to some earlier experiments, two Indian scientists found humidity has an inverse relationship to insect mortality. Using two controlled humidity levels, approximately 49% and 88%, they found that mosquito pupae grown in the lower humidity were more likely to be killed when exposed to varying doses of DDT as adults. The lethal dose for these mosquitoes also was lower than for those kept at high humidity.

T. Koshi and S. K. Ranganathan, Technical Development Establishment Laboratories, Kanpur, India, explain their results as indicating a difference between the effects of insecticide availability and the variations in insect susceptibility due to humidity. Earlier reports of greater mortality following greater relative humidity may have simply represented more available insecticide.

The new research is reported in *Nature* (Jan. 18).

Science News Letter, February 1, 1958

#### METEOROLOGY

### Bureau Will Use New Storm Warning Signals

► THE WEATHER BUREAU has begun using a new, simplified system of flags and lights for warning of storms along the seacoasts and the Great Lakes.

The system requires only four separate flag or light signals instead of the previous seven.

Explanation of the new signals:

Small Craft Warnings: One red pennant

displayed by day, and one red light above one white light at night to indicate that winds up to 38 miles per hour and/or sea conditions dangerous to small craft operations are forecast for the area.

Gale Warning: Two red pennants displayed by day, and one white light above one red light by night to indicate that winds ranging from 39 to 54 miles per hour are forecast for the area.

Whole Gale Warning: A single square red flag with a black center displayed by day, and two red lights at night to indicate that winds ranging from 55 to 73 miles per hour are forecast for the area.

Hurricane Warning: Two square red flags with black centers displayed by day, and one white light between two red lights at night to indicate that winds 74 miles per hour and above are forecast for the area.

Introduction of the new system is reported in the *Monthly Weather Review*, a Weather Bureau publication.

Science News Letter, February 1, 1958

### RADIO

Saturday, Feb. 8, 1958, 1:30-1:45 p.m., EST.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Mr. George E. Probst, executive director, Thomas Alva Edison Foundation of New York, will discuss "Edison's 111th Birthday."

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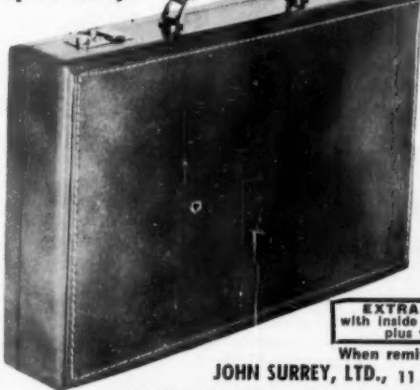
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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**ADVENTURES IN MEDICAL EDUCATION: A Personal Narrative of the Great Advance of American Medicine—G. Canby Robinson—Harvard Univ. Press for the Commonwealth Fund, 338 p., illus., \$5.** A history of medicine in this country from the colonial days when doctors were trained as apprentices through the days when great medical schools were built up.

**ANIMAL BEHAVIOR—John Paul Scott—Univ. of Chicago Press, 281 p., illus., \$5.** The general reader, student or animal lover can here learn what scientists have found out about behavior of various kinds of animals.

**BASIC FACTS ABOUT MENTAL ILLNESS—Harry Milt, foreword by George S. Stevenson—Science and Health Pub. (Mental Health Materials Center), 31 p., paper 50¢.** Aid in recognizing when someone near to us needs psychiatric help.

**THE CHEMISTRY AND BIOLOGY OF YEASTS—A. H. Cook, Ed.—Academic, 763 p., illus., \$22.** Presented by a number of authors, each concerned with research in a special area of the field.

**CONSERVATION EXPERIENCES FOR CHILDREN—Effie G. Bathurst and Wilhelmina Hill—Govt. Printing Office, Office of Education Bulletin 1957, No. 16, 192 p., illus., paper, 75¢.** Reporting how teachers are helping boys and girls learn about our natural resources.

**ELEMENTS OF CLASSICAL THERMODYNAMICS FOR ADVANCED STUDENTS OF PHYSICS—A. B. Pippard—Cambridge Univ. Press, 165 p., illus., paper \$2.75, cloth \$4.75.** For the advanced student.

**ELEMENTS OF MODERN ABSTRACT ALGEBRA—Kenneth S. Miller—Harper, 188 p., \$5.** For upper class mathematics majors or graduate students.

**ENGINEERING MATERIALS HANDBOOK—Charles L. Mantell, Ed. in Chief—McGraw-Hill, 1936 p., illus., \$21.50.** Emphasis on the fabricated forms of materials, their physical and mechanical properties, advantages and limitations.

**FOUNDATIONS OF SCIENCE: The Philosophy of Theory and Experiment—Norman Robert Campbell—Dover, 565 p., paper, \$2.95.** A critique of fundamental concepts of science, particularly physics.

**FUNDAMENTAL MATHEMATICS: A Text and Workbook—Leslie H. Miller—Holt, 323 p., paper, \$3.50.** Reviews arithmetic and algebra and presents some topics from geometry and

trigonometry. Treats the student as a mature individual.

**GENERAL DIAGNOSIS AND THERAPY OF SKIN DISEASES: An Introduction to Dermatology for Students and Physicians—Hermann Werner Siemens, translated from the German by Kurt Wiener—Univ. of Chicago Press, 324 p., illus., \$10.** Presenting basic principles illustrated with photographs taken at the skin clinic of the University of Leiden, Holland.

**THE LONGEVITY AND MORBIDITY OF COLLEGE ATHLETES—Henry J. Montoye and others—Phi Epsilon Kappa Fraternity, 139 p., illus., paper, \$3.25.** No appreciable difference was found between athletes and non-athletes in length of life. An interesting difference was that a disproportionately large number of former baseball players chew tobacco while cross-country runners smoke pipes.

**METHOD AND THEORY IN AMERICAN ARCHAEOLOGY—Gordon R. Willey and Philip Phillips—Univ. of Chicago Press, 270 p., \$4.75.** Concerning especially American archaeology.

**PRINCIPLES OF PERCEPTION—S. Howard Bartley—Harper, 482 p., illus., \$6.50.** For beginning students.

**SEA TEMPERATURE IN THE GULF OF ALASKA AND IN THE NORTHEAST PACIFIC OCEAN—Margaret K. Robinson—Univ. of Calif. Press, 98 p., illus., paper, \$2.** At depths of 200, 300, and 400 feet coldest temperatures frequently occur in summer rather than in winter.

**SOCIAL CHANGE IN THE SOUTH PACIFIC: Rarotonga and Aitutaki—Ernest Beaglehole—Macmillan, 268 p., \$6.50.** These Pacific islands with homogeneous population received their first stimulus to social change when missionaries introduced Christianity. What has happened to the natives since is the theme of this book.

**TUNNEL IN THE DESERT: An Underground Venture in Education—William H. Carr—Arizona-Sonora Desert Museum, 34 p., illus., paper, 60¢.** Describing a novel museum underground designed so that the public can see what desert creatures do when they are hiding away from the hot desert sun.

**VALUES IN A UNIVERSE OF CHANCE: Selected Writings of Charles S. Peirce—Philip P. Wiener, Ed.—Stanford Univ. Press, 446 p., paper \$1.25, cloth \$3.95.** Some of the selections are previously unpublished.

**VAN NOSTRAND'S SCIENTIFIC ENCYCLOPEDIA—Leo A. Aroian and others, Eds.—Van Nostrand, 3d ed., 1839 p., illus., \$26.85 until March 17, \$30. thereafter.** Explaining 15,000 terms of fundamental interest. Arranged alphabetically for convenient reference.

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## EDUCATION

# Criticize Education Plan

More than scholarships for students is needed if the nation is to solve its education problem, the experts say. Improved school facilities and larger teaching staffs are needed.

► THE ADMINISTRATION'S proposed multi-million dollar scholarship program to entice more students into scientific and engineering careers may do more harm than good.

This is the criticism of many educators and manpower experts.

The proposed program has the potential of worsening an already bad situation, they say.

The major criticism is that scholarships help students but do nothing for the colleges and universities currently in urgent need of dollars.

Student recruitment, they explain, is no longer a major problem. In many instances schools cannot take more students. Engineering enrollments, for example, were at an all-time high in 1957 and many of the nation's top engineering schools now have waiting lists extremely long.

The major problem is overcrowded and understaffed colleges and universities. The problem promises to become worse before it improves. U. S. Commissioner of Education Lawrence G. Derthick recently predicted that college enrollments would more than double in the next ten years.

"The Administration in its proposed scholarship program has made no provision for helping the colleges and universities to expand their staffs and facilities," Dr. Howard Meyerhoff, executive director of the Scientific Manpower Commission, Washington, said.

"There is no possible way in the foreseeable future for our engineering schools to absorb more students unless they get substantial help."

In the same vein, Dr. Eric A. Walker, vice-chairman of the President's Committee on Scientists and Engineers and president of Pennsylvania State University, said he was at odds with the proposed program for scholarships because it doesn't "help the universities at all."

One of the biggest fears if the flood gates of potential students are opened up is that academic standards will suffer. This might prove more devastating than having a shortage of students.

What is needed in any Federal program, the experts are convinced, is money for colleges and universities that will enable them to enlarge their staffs, build new buildings and facilities.

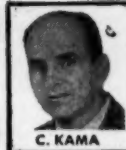
Perhaps a more serious shortage than students is that of qualified teachers, partially a result of industry having pirated professors and graduate students away from colleges and universities.

Dr. Meyerhoff's Commission, which pointed to the scientific and engineering manpower shortage in pre-sputnik days, said that:

"The major problem is no longer one of student recruitment but of educational quality all along the line and the provision of adequate facilities and faculty for higher education in engineering and science. We see no compelling reason for altering that basic emphasis."

Science News Letter, February 1, 1958

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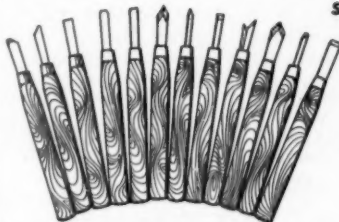


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## BIOLOGY

### Marine Fungus Needs Vitamin B-12 to Live

► DISCOVERY of a marine fungus that needs vitamin B-12 to live may provide scientists with an important research tool—a way to measure how much of this important vitamin is contained in sea water.

This is the first report of a fungus known to need an outside source of B-12.

Drs. Elizabeth J. Adair and Helen S. Vishniac, department of microbiology at Yale University, report in *Science* (Jan. 17) that *Thraustochytrium globosum* should make a good "assay organism" for two reasons. It has a shorter incubation period than the best organism now being used and it does not respond to pseudovitamin B-12 or some other factors that complicated earlier analyses of sea water.

Experiments designed to test the vitamin B-12 requirement of the marine fungus showed greater growth accompanying greater amounts of the vitamin. Subsequent use of the organism to evaluate B-12 content of sea water was successful, the scientists report. In fact, higher levels of the vitamin were found than had been reported in other tests.

Their vitamin B-12 requirement places the marine fungus in the same group of organisms as the bacteria, algae and animals. Higher plants neither require nor produce the vitamin.

Science News Letter, February 1, 1958

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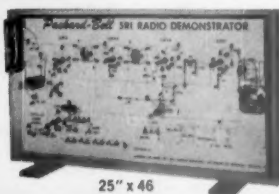


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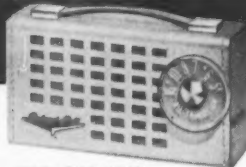
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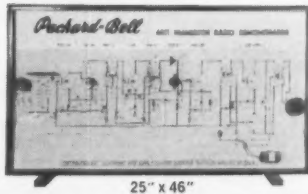


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# Questions

**BIOLOGY**—What characteristic does a marine fungus share with bacteria, algae and animals? p. 78.

**MEDICINE**—How can skin grafts be used to predict the characteristics of the animals' offspring? p. 71.

What group of chemicals does the new tuberculosis drug belong to? p. 72.

**PHYSICS**—How long were British scientists able to keep the hot plasma isolated from the container walls of ZETA? p. 67.

Photographs: Cover, British Information Services, Inc.; p. 67, American Cyanamid Company, Lederle Laboratories Division; p. 74, George Washington University; p. 80, Eastman Chemical Products, Inc.

## Do You Know?

*Hemiplegia* is the medical term for the partial paralysis that may occur as a result of a cerebral vascular accident, commonly called a "stroke."

By using the rate of decay of radioactive potassium, the age of bedrock under New York City has been established at 380,000,000 years.

More than 1,250 caves are known in western Virginia; of these more than 300 occur in Montgomery County.

*Sea anemones* are static animals that live by entrapping other organisms with the stinging tentacles.

One farm worker feeds about 18 people with 1,600 pounds of food a year per person.

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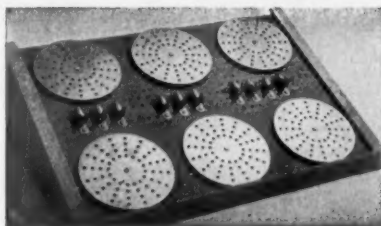
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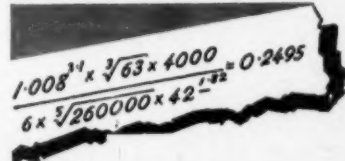
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# • New Machines and Gadgets •

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✿ **CRYSTAL RADIO KIT** is said to require no wiring, soldering or drilling. It has a printed circuit and permanent connections are made with a screwdriver. A preassembled dial cord permits use of a slide rule dial. The kit comes complete with earphones.

Science News Letter, February 1, 1958

✿ **FLOODLIGHTING FITTINGS** include surface-wall and through-wall mountings that eliminate separate splice boxes. Designed for building facades, patios, gardens and parking areas, the fittings are made of aluminum and are tapped one-half inch.

Science News Letter, February 1, 1958

✿ **ASTRONOMICAL TELESCOPE** for the do-it-yourselfer comes with all the optics needed for making a six-inch reflecting instrument. The kit consists of a mirror blank, a tool for grinding the blank, two lenses, a first surface diagonal mirror, magnifying lens and eight assorted abrasives.

Science News Letter, February 1, 1958

✿ **HOSPITAL DRUG DISPENSER**, shown in the photograph, holds 20 tablets, releasing them one at a time when plunger is pressed. The unit's clear face permits an



immediate visual inventory, an aid in positive control of drug supplies in hospitals. Made of rust-free butyrate plastic, the dispenser is designed for easy handling.

Science News Letter, February 1, 1958

✿ **HOOK GUARD** for fishermen prevents snarled treble hooks. The guard can be snapped on and off. It is available in spin-

ning or casting sizes and is described as permitting fishermen to carry treble hooks in their pockets without snagging their clothes.

Science News Letter, February 1, 1958

✿ **FLAT SCALE** for drawing board use keeps its back to the drawing board and all eight scales toward the user. Unlike its triangular counterpart, it does not have to be twirled. Made of a clear acrylic plastic, all eight scales have been laid out side by side.

Science News Letter, February 1, 1958

✿ **FAST-ADJUSTING TRIPOD** made of aluminum weighs four and one-half pounds. A guide-on adapter aids in attaching cameras and a panhead locks securely in any position. The panhead can be tilted to either side as well as moved vertically and horizontally.

Science News Letter, February 1, 1958

✿ **ELECTRIC THERMOSTAT** can be used in temperature ranges up to 700 degrees Fahrenheit. It is designed to control three separate heating phases, one of which is on continuously when the dial is moved from "off." The control is available in nine ranges and is housed in a pressed steel case.

Science News Letter, February 1, 1958



## Nature Ramblings



By HORACE LOFTIN

➤ **RELATIONS** between humans and bats have been somewhat strained for the last several thousand years or so! In general, bats are harmless enough, but their "unnatural" form, their nocturnal habits, their secrecy have caused men to fear and distrust them. Superstitions have grown up around the dim figures of bats flitting in the twilight, and perhaps the most chilling of these is the legend of the vampire.

The vampire is supposed to be a supernatural being who changes himself at will, or on the full of the moon or other variation, into a bat that sucks the blood of helpless victims. This legend can be traced far back into the folklore of Europe and Asia, long before the New World was discovered.

There are no blood-sucking bats in the Old World that may have led to the rise of this legend, and it must be accredited to some prehistoric yarn teller. Oddly

### Flying Mammals



enough, however, the explorers of tropical America did find a bat nourished wholly on the blood it sucks from living victims. Naturally enough, they called it the vampire bat!

There is nothing supernatural about this mouse-sized creature, regardless of its unusual means of livelihood. It usually attacks sleeping animals—horses, fowls, an occasional man—making a neat slit with its razor-like teeth, then lapping up a small

amount of blood. Rarely does the victim awaken during the bat's feast and generally little harm is done to the supplier of the feast.

The vampire bat, *Desmodus rufus*, is the exception that proves the general rule of the harmlessness of bats, however. Some groups of bats are carnivorous, some are fruit eaters and the majority are avid eaters of insects.

The order of bats (Chiroptera) can be distinguished from any other mammals by their wings and the ability of true flight. The front limbs are highly modified for flight, with the fingers greatly elongated to support the membrane which acts as the wing.

Being called "blind as a bat" is no insult, since they have good eyesight. Even better than eyesight for their purposes, though, is a "radar" system of high squeaks which echo back from an insect, letting the bats know where to strike for him in the dark!

Science News Letter, February 1, 1958

